

Date: Tue, 12 Apr 94 04:30:35 PDT  
From: Ham-Space Mailing List and Newsgroup <ham-space@ucsd.edu>  
Errors-To: Ham-Space-Errors@UCSD.Edu  
Reply-To: Ham-Space@UCSD.Edu  
Precedence: Bulk  
Subject: Ham-Space Digest V94 #88  
To: Ham-Space

Ham-Space Digest                      Tue, 12 Apr 94                      Volume 94 : Issue    88

Today's Topics:

    \* SpaceNews 11-Apr-94 \*  
        2 Line ElSets  
        Building Sat antennas (2 msgs)  
        Eprom 27C512 with access time of 120 ns  
        Meteosat/APT Trans. Sked  
        Oscar Antennas ??  
        SAREX Keps 4/11/94 at 8:00 UTC  
        Two-Line Orbital Element Set: Space Shuttle

Send Replies or notes for publication to: <Ham-Space@UCSD.Edu>  
Send subscription requests to: <Ham-Space-REQUEST@UCSD.Edu>  
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Space Digest are available  
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-space".

We trust that readers are intelligent enough to realize that all text  
herein consists of personal comments and does not represent the official  
policies or positions of any party. Your mileage may vary. So there.

-----  
Date: Mon, 11 Apr 1994 10:05:43 MDT  
From: ihnp4.ucsd.edu!usc!howland.reston.ans.net!europa.eng.gtefsd.com!  
MathWorks.Com!yeshua.marcam.com!zip.eecs.umich.edu!newsxfer.itd.umich.edu!  
nntp.cs.ubc.ca!alberta!ve6mgs!usenet@network.UCSD  
Subject: \* SpaceNews 11-Apr-94 \*  
To: ham-space@ucsd.edu

SB NEWS @ AMSAT \$SPC0411  
\* SpaceNews 11-Apr-94 \*

BID: \$SPC0411

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SpaceNews  
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MONDAY APRIL 11, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is published every week and is made available for unlimited distribution.

\* NEW AO-13 SCHEDULE \*

=====

Magnetorquing from attitude 180/0 to 230/-5 commenced on Apr 04 [Fri] 1810 UTC, orbit 4446/224, and continued for 8 perigees. The new schedule commenced on orbit 4452 MA 145 Apr 07 [Thu] 1120 UTC.

\*\*\* AO-13 TRANSPONDER SCHEDULE \*\*\* 1994 Apr 07-Jul 11

Mode-B : MA 0 to MA 170 |  
Mode-BS : MA 170 to MA 218 |  
Mode-S : MA 218 to MA 220 |<- S beacon only  
Mode-S : MA 220 to MA 230 |<- S transponder; B trsp. is OFF  
Mode-BS : MA 230 to MA 250 | Alon/Alat 230/-5  
Mode-B : MA 250 to MA 256 |  
Omnis : MA 250 to MA 120 | Move to attitude 180/0, Jul 11

NEW ATTITUDE - Note: The mean attitude for the period 1994 Apr 07-Jul 11 will be ALON/ALAT 230/0. This is an Alon 10 degrees "better" than originally proposed. It is achieved at the expense of a 10 degree "worse" Sun angle, which will now reach 40 degrees (77% illumination) May 30-Jul 11. During that period the Mode-B transponder *might* have to be OFF from MA 250-80 to conserve battery power.

Please don't rely on gossip and rumour! Continuous up to date information about AO-13 operations is always available on the beacons, 145.812 MHz or 2400.664 MHz in CW, RTTY and 400 bps PSK. These bulletins are also posted to Internet, ANS, Packet, PacSats etc, and many international newsletters. A 400 bps PSK decoder is available from G3RUH and several DSP products; display software P3C.EXE etc from many AMSAT groups.

The active command stations are listed below, and constructive feedback about operations is always welcome.

Peter DB20S @ DB0FAU.#NDS.DEU.EU  
James G3RUH @ GB7DDX.#22.GBR.EU  
Graham VK5AGR @ VK5WI.#ADL.#SA.AUS.OC

The above may also be reached via Internet (callsign@amsat.org) and K0-23.

Please remember to state clearly a return address.

Notes prepared on behalf of, and in total cooperation with the above by:

James Miller G3RUH @ GB7DDX.#22.GBR.EU 1994 Apr 04 [Mon] 0600 UTC

★ AMSAT NET VIA SATELLITE ★

=====

Bruce Paige, KB5ZRV, is the AMSAT Area Coordinator in Houston, Texas. Bruce runs a local AMSAT net that meets on the 147.100 MHz repeater every Tuesday evening at 10:00 PM local Central Time. The net is rebroadcast over the Galaxy 3 satellite, Transponder 17 on a 5.8 MHz subcarrier.

This net is then received live and retransmitted by repeater operators in Toronto, Canada, Anchorage, Alaska (3 repeaters), New England States (6 repeaters), Ontario, CA, Lawton, OK, Indianapolis, IN, Fargo, ND. It has also been heard in Hawaii and other states.

The net has a telephone number for those that would like to ask questions of the net or check in. There are beginners segments that lasts 3-5 minutes, and explain how satellite novices can work various satellites, describes different types of station equipment necessary to work satellites, and other topics that beginners find useful in getting started in satellite operations. SAREX operating techniques have also been covered.

This net re-broadcast is free for the taking by those with TVRO ground stations. The people who run the net are having a great time and have found many people are listening in that do not have AMSAT nets in their local areas.

Any comments can be directed to Bruce via the Internet at kb5zrv@amsat.org.

★ FO-20 SCHEDULE ★

=====

The FO-20 command station announced that FO-20 will be placed in Mode JA (Analog transponder mode) during Field Day 1994 (25-Jun-94 18:00 UTC through 26-Jun-94 18:00 UTC).

The current operating schedule is as follows:

Analog mode:

06-Apr-94 06:45 -to- 13-Apr-94 07:10 UTC  
20-Apr-94 07:35 -to- 27-Apr-94 07:55 UTC  
11-May-94 06:54 -to- 18-May-94 07:20 UTC

Digital mode:

Unless otherwise noted above.

[Info via Kazu Sakamoto, JJ1WTK]

\* FUJI AWARD INFORMATION \*

=====

Kazu Sakamoto, JJ1WTK, reports that a "Fuji" award is available to users of the FO-20 satellite. Applicants should have confirmed CW or SSB contacts with 10 different amateur stations through the FO-20 Amateur Satellite. A fee of 8 IRCs or US \$4 will be charged per award. An additional 2 IRCs will be charged for air mail delivery regardless of the number of the awards claimed. If QSL cards are submitted, sufficient funds for return postage will also be required.

Correspondence should be sent to:

Japan Amateur Radio League -- Award Desk  
1-14-2 Sugamo, Toshima, Tokyo 170, Japan

\* SpaceNews BBS UPDATE \*

=====

The SpaceNews packet radio BBS sponsored by Mario, KD6ILO, reported in last week's issue of SpaceNews has changed frequency. It can now be found operating on 145.050 MHz. The latest issue of SpaceNews, as well as other AMSAT and satellite-related news and information can be found on this BBS. The BBS is also linked to the UoSAT-OSCAR-22 satellite through the N7RSN SatGate also located in Tacoma, WA.

\* THANKS! \*

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Thanks to all those who sent messages of appreciation to SpaceNews, especially:

K2UVG

VE3OZL

W4AT

ZR5JRS

VE7AHX

\* FEEDBACK/INPUT WELCOMED \*

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Mail to SpaceNews should be directed to the editor (John, KD2BD) via any of the following paths:

FAX : 1-908-747-7107

PACKET : KD2BD @ N2KZH.NJ.USA.NA

INTERNET : kd2bd@ka2qhd.ocpt.ccur.com -or- kd2bd@amsat.org

MAIL : John A. Magliacane, KD2BD

Department of Engineering and Technology  
Advanced Technology Center  
Brookdale Community College  
Lincroft, New Jersey 07738  
U.S.A.

<<= SpaceNews: The first amateur newsletter read in space! -=>>

/EX

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John A. Magliacane, KD2BD \* /\ \* Voice : 1-908-224-2948  
Advanced Technology Center |/\| Packet : KD2BD @ N2KZH.NJ.USA.NA  
Brookdale Community College |/\| Internet: kd2bd@ka2qhd.ocpt.ccur.com  
Lincroft, NJ 07738 \* /\ \* Morse : -. -.. ..--- .... -..

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Date: 11 Apr 94 19:56:56 GMT  
From: hp-cv!hp-pcd!hpcvsnz!charlier@hplabs.hp.com  
Subject: 2 Line ElSets  
To: ham-space@ucsd.edu

leeannmyk@aol.COM wrote:

: Hello, My name is Mike Johnson. I am looking for a source for  
: USSPACECMD/NORAD type 2 line element sets for a variety of vehicles (primarily  
: 16609).

: Any help in finding this (these) source(s) would be greatly appreciated.  
: I can also be contacted at johnsonm@Rush.aps.rl.af.mil

No need to look any further. They are posted on a regular basis to  
this very notes group, with titles like:

ORBS\$098.2L.AMSAT

In fact here's the Mir data from a recent set:

Mir

1 16609U 86017 A 94090.25081547 0.00008348 11343-3 0 5496  
2 16609 51.6462 216.9197 0015558 91.3363 268.9434 15.58441517493803

--

Charlie Panek KX7L  
charlier@lsid.hp.com

Hewlett Packard Company  
Lake Stevens Instrument Division  
Everett, Washington

-----  
Date: 11 Apr 1994 14:40:09 GMT  
From: ihnp4.ucsd.edu!dog.ee.lbl.gov!agate!usenet.ins.cwru.edu!eff!news.kei.com!  
newsstand.cit.cornell.edu!newsstand.cit.cornell.edu!usenet@network.ucsd.edu  
Subject: Building Sat antennas  
To: ham-space@ucsd.edu

In article <Cnyq2s.80@ncifcrf.gov> Joe Mack, mack@ncifcrf.gov writes:  
>Get the ARRL &/or RSGB antenna handbooks. The calculations for a helix  
are  
>trivial. They are wideband and non-critical in dimensions, unlike a  
yagi.  
>

Yeah, that is a very nice feature of them. Mine kept falling over tripod  
and all when I first put it up (hey, I'm an EE, not an ME :-)) and all the  
dings  
and bends didn't seem to faze it.

As for the calculations - my suggestion would be to put the formulas into  
a spreadsheet so you can diddle the values and see what you come up with.  
That is what I did and it was very handy in finally converging on a  
working  
design.

> However people don;t build them at 2m very often - they are more  
>often used at UHF . I don't really know why but here are some guesses  
>  
> A 2m helix is large and hard to support (rods out from the center  
>pole to the helix are long).

That is one important reason - they get fairly unweildy. After my  
success with my 420-450 helix, I looked into doing one for 2 but  
gave it up because of the size.

I think the other big reason is it's not as efficient an antenna for  
the boom length. My 14 turn helix is 10 foot long and has about 15  
db of gain. You can get the same gain smaller and lighter in a yagi  
arrangement - but they are much trickier to adjust and have much  
smaller usable bandwidth.

>  
> It isn't 50 ohms. Itsa bout 140ohms and there are tricks to make  
>it 50ohms but these are narrow band (still wide band by ham band  
standards)  
>and a little tricky to get going.

Go with the radial feed method (instead of coming into the center to feed, you squish the last turn into half the space, fatten the conductor to about 5 times the regular size (I used copper flashing) and feed it off the center where the turn comes down to the ground plane. On mine it easily handles the band from 420 to 450. I use the same antenna for Oscar, ATV, SSB and FM.

>  
> Maybe you can make more money by selling a yagi than a helix.  
>  
> It would be interesting to find out the real reason, but most people  
> if they want a fair bit of gain at 2m and 432 and want circular  
polarisation  
> they use crossed beams  $1/4\lambda$  apart

I think that is mostly the size vs gain issues. Helix'es are simple, cheap, forgiving, fun and work well. But they aren't the smallest antenna on the block.

73 de Kevin, WB2EMS

"Coffee, that elixir which makes life possible before noon. "

-----  
Date: Mon, 11 Apr 1994 15:40:30 GMT  
From: ihnp4.ucsd.edu!swrinde!emory!wa4mei!ke4zv!gary@network.ucsd.edu  
Subject: Building Sat antennas  
To: ham-space@ucsd.edu

In article <JAY.17.2DA57809@medicine.dmed.iupui.edu> JAY@medicine.dmed.iupui.edu (Jay Sissom) writes:

> I am new to satellite communications. (This is just a warning!)  
>  
> I would like to build a 2m & a 70cm beam for use with satellites. Does anyone  
> know of an article in QST or some other plan for such antennas?  
> From what I understand, a normal 2m or 70cm beam antenna would work, but a  
> circular polarization would be much better. I have no idea how one would  
> build a circular polarized antenna.

Circular polarized crossed yagis are fairly simple to build. There are a couple of ways to get circular polarization with them. The way KLM does it is to space one of the antennas  $1/4$ -wave further up the boom than the other and then combine the two antennas with a simple matching harness (two  $1/4$ -wave 75 ohm cables to a Tee fitting). Or you can take the Cushcraft path and mount the two antennas' elements at the same

points on the boom and combine them as above, but with an additional 1/4-wave length of 50 ohm cable in one leg to get the required 90 degree phase shift.

There are other forms of circularly polarized antennas. A couple are the helix (both axial and quadrafilar) and the Lindenblad. You can also use disc or loop yagis with crossed dipole driven elements. These are more common at S band.

A nice simple antenna for S band can be constructed of all thread rod for the boom, fender washers for parasitic elements, and a bunch of jam nuts to hold everything in place. The crossed dipole driven elements can be made from a piece of printed circuit board (duroid) with the driven elements and their phasing and matching harnesses etched onto the board and held in place with nylon jam nuts. The whole thing will fit in a piece of PVC or fiberglass tubing for weatherproofing, or you can just cover the driven elements and reflector with pipe and let the rest hang out in the breeze after a cold galvanize spray. (You could use circuit board for all the elements, but that much duroid board gets expensive.)

(You can use a short bolt, a drill, and a file to size the OD of the parasitic element washers. Just put the washer on the bolt with jam nuts, chuck it in the drill, and file to size.)

Gary

--

Gary Coffman KE4ZV		You make it,		gatech!wa4mei!ke4zv!gary
Destructive Testing Systems		we break it.		uunet!rsiatl!ke4zv!gary
534 Shannon Way		Guaranteed!		emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244				

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Date: Mon, 11 Apr 1994 13:32:59 GMT

From: ihnp4.ucsd.edu!usc!howland.reston.ans.net!torn!news.unb.ca!upei.ca!UPEI.CA!seeler@network.ucsd.edu

Subject: Eprom 27C512 with access time of 120 ns

To: ham-space@ucsd.edu

I was wondering if anyone knew of a Canadian or US distributor or supplier for the following two items which are being considered for the Trakbox hardware upgrade:

1. 27C512 Eprom (Dip package) with 120 nanosecond access time.
2. Dallas Semiconductor microprocessor DS80C320

Any suggestions as to names or numbers would be greatly appreciated.



73 de David Seeler,  
VY2DCS  
Internet: seeler@upeil.ca

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Date: Mon, 11 Apr 94 14:10:40 CDT  
From: ihnp4.ucsd.edu!agate!msuinfo!netnews.upenn.edu!iat.holonet.net!vulcan!  
n4nr@network.ucsd.edu  
Subject: Meteosat/APT Trans. Sked  
To: ham-space@ucsd.edu

I am looking for an up to date Meteosat 3 /APT Transmission schedule.  
Would really appreciate a copy....Thanks!

--  
Dennis T. Dease                   internet - n4nr@vulcan.com (or n4nr@amsat.org)  
Pelham, Alabama, USA           packet radio - n4nr@kd4cim.al.usa.na

-----  
Date: Mon, 11 Apr 1994 15:42:50 GMT  
From: ihnp4.ucsd.edu!swrinde!emory!wa4mei!ke4zv!gary@network.ucsd.edu  
Subject: Oscar Antennas ??  
To: ham-space@ucsd.edu

In article <T36Jkc2w165w@barf80.nshore.org> wb8k@barf80.nshore.org (Dennis  
jakubisin) writes:

>What the latest gossip concerning what good & what isn't on Oscar yagi's  
>for mode B & J.. KLM, M sqrd etc. Any comments?? The old Cushcraft AOP 1  
>pkg I have been using for a few years rally barks, especially in wet  
>weather.

You noticed that too, huh? :-)

I use the KLM-22C and the 40CX for my station. Clean patterns, good  
gain, and they hold up really well.

Gary

--  
Gary Coffman KE4ZV                   |    You make it,           | gatech!wa4mei!ke4zv!gary  
Destructive Testing Systems |    we break it.       | uunet!rsiatl!ke4zv!gary  
534 Shannon Way            |    Guaranteed!       | emory!kd4nc!ke4zv!gary  
Lawrenceville, GA 30244    |                            |

Date: Mon, 11 Apr 1994 02:17:31 -0600  
From: ihnp4.ucsd.edu!usc!howland.reston.ans.net!news.intercon.com!panix!  
zip.eecs.umich.edu!newsxfer.itd.umich.edu!nntp.cs.ubc.ca!alberta!ve6mgs!  
usenet@network.ucsd.edu  
Subject: SAREX Keps 4/11/94 at 8:00 UTC  
To: ham-space@ucsd.edu

SB SAREX @ AMSAT \$STS-59.010  
SAREX Keps Update 4/11 at 8:00 UTC

Greenbelt, MD, 4/11/94 at 8:00 UTC

The official SAREX element set for this morning will be GSFC-005. This element sent was generated by Ron Parise, WA4SIR, of the Goddard Space Flight Center. Gil Carman, WA5NOM, reports that the predictions using GSFC-005 are closer to the real-time Orbiter state vector than GSFC-007 or JSC-009.

STS-59

1	23042U	94020A	94	99.70643805	0.00018312	11043-4	10773-4	0	58
2	23042	56.9974	262.7245	0009489	267.3550	92.6453	16.20229092		67

Satellite: STS-59

Catalog number: 23042

Epoch time: 94099.70643805 (09 APR 94 16:57:16.25 UTC)

Element set: GSFC-005

Inclination: 56.9974 deg

RA of node: 262.7245 deg Space Shuttle Flight STS-59

Eccentricity: 0.0009489 Keplerian Elements

Arg of perigee: 267.3550 deg

Mean anomaly: 92.6453 deg

Mean motion: 16.20229092 rev/day Semi-major Axis: 6597.0622 Km

Decay rate: 0.18E-03 rev/day\*2 Apogee Alt: 224.93 Km

Epoch rev: 5 Perigee Alt: 212.41 Km

NOTE - This element set is based on NORAD element set # 005.

The spacecraft has been propagated to the next ascending node, and the orbit number has been adjusted to bring it into agreement with the NASA numbering convention.

Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group

/EX

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Date: 11 Apr 94 23:36:12 GMT

From: agate!howland.reston.ans.net!paladin.american.edu!zombie.ncsc.mil!  
blackbird.afit.af.mil!tkelso@uchvax.berkeley.edu  
Subject: Two-Line Orbital Element Set: Space Shuttle  
To: ham-space@ucsd.edu

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) \*253-9767\*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 59

```
1 23042U 94020A 94101.25000000 .00017734 11042-4 10466-4 0 118
2 23042 56.9964 255.2840 0011421 290.8126 76.0752 16.20196288 296
```

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Dr TS Kelso  
tkelso@afit.af.mil

Assistant Professor of Space Operations  
Air Force Institute of Technology

-----  
Date: Mon, 11 Apr 1994 14:15:30 GMT  
From: telesoft!garym@uunet.uu.net  
To: ham-space@ucsd.edu

References <STS-59.94098.748@alsys.com>, <STS-59.94100.261@alsys.com>,  
<STS-59.94100.508@alsys.com>  
Reply-To : elements-request@alsys.com  
Subject : STS-59 Element Set (94101.310)

STS-59

```
1 23042U 94020A 94101.31051560 +.00017734 11042-4 10466-4 0 112
2 23042 56.9964 254.9922 0011420 290.9416 69.0451 16.20198854 317
```

Satellite: STS-59

Catalog number: 23042

Epoch time: 94101.31051560 (11 APR 94 07:27:08.55 UTC)

Element set: GSFC-011

Inclination: 56.9964 deg

RA of node: 254.9922 deg

Eccentricity: 0.0011420

Arg of perigee: 290.9416 deg

Mean anomaly: 69.0451 deg

Space Shuttle Flight STS-59  
Keplerian Elements

Mean motion: 16.20198854 rev/day      Semi-major Axis: 6597.1443 Km  
Decay rate: 0.18E-03 rev/day\*2      Apogee Alt: 226.29 Km  
Epoch rev: 31      Perigee Alt: 211.22 Km

(for Shuttle Elements subscription info, email: listserv@alsys.com)

--

Gary Morris      Internet: elements-request@alsys.com  
KK6YB      Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA  
San Diego, CA, USA      Phone: +1 619-457-2700 x128

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Date: 11 Apr 94 16:30:36 GMT  
From: telesoft!garym@uunet.uu.net  
To: ham-space@ucsd.edu

References <STS-59.94098.748@alsys.com>, <STS-59.94100.508@alsys.com>,  
<STS-59.94101.310@alsys.com>  
Reply-To : elements-request@alsys.com  
Subject : STS-59 Element Set (94101.619)

STS-59

1 23042U 94020A 94101.61900344 +.00018288 11044-4 10712-4 0 120  
2 23042 56.9946 253.5022 0010718 289.2110 70.7819 16.20252631 360

Satellite: STS-59

Catalog number: 23042  
Epoch time: 94101.61900344      (11 APR 94 14:51:21.90 UTC)  
Element set: GSFC-012  
Inclination: 56.9946 deg  
RA of node: 253.5022 deg      Space Shuttle Flight STS-59  
Eccentricity: 0.0010718      Keplerian Elements  
Arg of perigee: 289.2110 deg  
Mean anomaly: 70.7819 deg  
Mean motion: 16.20252631 rev/day      Semi-major Axis: 6596.9983 Km  
Decay rate: 0.18E-03 rev/day\*2      Apogee Alt: 225.68 Km  
Epoch rev: 36      Perigee Alt: 211.54 Km

(for Shuttle Elements subscription info, email: listserv@alsys.com)

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Gary Morris      Internet: elements-request@alsys.com  
KK6YB      Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA  
San Diego, CA, USA      Phone: +1 619-457-2700 x128

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End of Ham-Space Digest V94 #88  
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